REMARKS/ARGUMENTS

Summary of Rejections

The Examiner has rejected claims 1, 6-8, 13-14, 18-37 under 35 U.S.C. 103(a) as being unpatentable over Kates (U.S. Patent Pub. No. 2002/0176584 A1) in view of newly cited Keller (U.S. Patent Pub. No. 2004/037428 A1) as set forth at pages 2-12 of the Office Action.

The Examiner has rejected claims 11-12 under 35 U.S.C. 103(a) as being unpatentable over Kates in view of Keller, in further view of Rader et al. (U.S. Patent Pub. No. 2003/0064746 A1) as set forth at pages 12-13 of the Office Action.

The Examiner has rejected claims 2-4, 9-10 and 15-17 under 35 U.S.C. 103(a) as being unpatentable over Kates, in view of Keller, in further view of Harrel et al. (U.S. Patent App. Pub. No. 2003/0073408) as set forth at pages 13-17 of the Office Action.

The Examiner has rejected claim 5 under 35 U.S.C. 103(a) as being unpatentable over Kates, in view of Keller, in further view of "office notice" regarding "seals".

Preliminary remarks

As a preliminary matter, the Applicant notes that the Examiner sometimes uses the term "anticipates" in his rejections whereas 35 U.S.C. 103(a) is clearly cited and the Examiner relies on a combination of references in his substantive rejections. The Applicant has therefore treated this as a typographical error on the Examiner's part. The Applicant also notes that the Examiner no longer relies upon U.S. Patent No. 7,050,592 (Iseberg et al.) and so this reference is not addressed in the present response.

Patentability of Claims 1, 14, 23 and 31

The Applicant respectfully submits that the subject matter defined by the amended claims would have not have been obvious to a person of skill in the art at the time the invention was made in view of the above-noted references for reasons set forth below. Reconsideration and withdrawal of the rejections under 35 U.S.C. 103(a) is requested for the following reasons.

The subject matter of the present application is directed to an electronic acoustic device such as a mobile voice-enabled communications device which has been configured to use an auxiliary input/output device to test the microphone and/or speaker of the mobile device.

In a microphone test mode, an audio generator generates a microphone test signal (in electric form) which is output to an external speaker which generates an acoustic version of the microphone test signal. The output of the external speaker is picked up by the microphone of the mobile device. The output of the microphone (in electric form) is routed to the auxiliary input/output device via the microprocessor of the mobile device where it is output and analyzed on an external test system. This is the subject matter of independent claim 1 which relates to a method of testing audio performance. Claim 23 is directed to a system for testing audio performance in accordance with method claim 1.

In a speaker test mode, an audio generator generates a speaker test signal which is input (in electric form) to the mobile device via the auxiliary input/output device. The input is routed the microprocessor of the mobile device to its speaker which generates an acoustic version of the speaker test signal. The output of the speaker is picked up by an external microphone which outputs the signal in electric form to an external test system where it is analyzed. This is the subject matter of independent claim 14 (and dependent claim 13). Claim 31 is directed to a system for testing audio performance in accordance with method claim 14.

Claims 1 and 14

Claims 1 and 14 have been amended to include the limitation that the acoustic device is a mobile voice-enabled communications device comprising a microprocessor, a microphone connected to the microprocessor, a speaker connected to the microprocessor, and an auxiliary input/output device connected to the microprocessor.

Claim 1 has been further amended to recite a method of testing audio performance and to clarify that a microphone *electric* audio *test* signal is produced and provided as input to an external speaker, and that it is a microphone *acoustic* audio *test* signal is output from the external speaker and received as input to the microphone of the mobile voice-enabled communications device. The amendments also clarify that a microphone *electric* audio *output* signal is output from the microphone, the signal being directly routed from the microphone to the auxiliary input/output device using the microprocessor where it is output to an external test system and analyzed. These amendments clarify that the test signal and output signal which are analyzed relate to the microphone rather than the speaker of the mobile device. The cited references are concerned with the output of the device speaker.

Kates

Kates describes a method and device which incorporates initializing, fitting and performance measuring features into a digital signal processing (DSP) circuit of a hearing aid 110. Kates uses a conventional hearing aid test system 101 in which the hearing aid 110 is placed in a test box 102.

At pages 2-3 of the Office Action, the Examiner equated the acoustic test signal 109 produced by the loudspeaker 108 as "providing the acoustic audio signal output from the external speaker as an input to the device microphone" in the previously pending claims. However, this signal is equivalent to a speaker *acoustic* audio *test* signal as it is used to test the output of the speaker, as explained below.

As noted in Applicant's previous reply, in Kates an external computer 104 generates an electric test signal which is sent to a loudspeaker 108 which produces an acoustic test signal (109; 152) which is received by the hearing aid 110 as input via the internal microphone 154. The acoustic audio signal 152 is then converted to an electric audio signal which is processed by the DSP circuit 156, amplified by the amplifier 160, and converted by the receiver 160 back to an acoustic audio signal 162 which is output. In Kates, the receiver 160 acts as the "speaker" of the hearing aid 110. The acoustic audio signal 162 is then transmitted to the acoustic coupler 114 via a piece of tubing 113, and then sent back to the external computer 104 for analysis (see FIG. 1B). Thus, the acoustic test signal 109 is used to test the output of the "speaker" of the hearing aid and so is equivalent to a speaker *acoustic* audio *test* signal.

Thus, the acoustic audio signal 162 which is output and transmitted to the external testing system (i.e., the acoustic coupler 114) in Kates is equivalent to a speaker *acoustic* audio *output* signal. The acoustic coupler 114 receives the acoustic audio signal 162 (i.e., the speaker *acoustic* audio *output* signal) and generates and an electric audio signal which is sent back to the external computer 104 and analysed. Thus, the electric audio signal which is sent back to the external computer 104 and analysed is equivalent to a speaker *electric* audio *output* signal.

At pages 2-3 of the Office Action, the Examiner has also equated the signal output by the hearing aid 110 which is transmitted to the acoustic coupler 114 as "outputting a further electric audio signal corresponding to the acoustic audio signal" in the previously pending claims. However, as noted above, the output sent to the acoustic coupler 114 is equivalent to a speaker *acoustic* audio *output* signal and the converted signal sent from the acoustic coupler 114 to the external computer 104 is equivalent to a speaker *electric* audio *output* signal. Thus, Kates is not concerned with microphone test and output signals as required by amended claim 1. Speaker test and output signals are discussed below in connection with claim 14.

In view of the above, Kates does not describe the following features recited by amended claim 1:

(1) testing a mobile voice-enabled communications device comprising a microprocessor, a microphone connected to the microprocessor, a speaker connected to the microprocessor, and an auxiliary input/output device connected to the microprocessor;

(2) producing a microphone electric audio test signal on an audio generator external to the mobile voice-enabled communications device and providing the microphone electric audio test signal of the audio generator as input to an external speaker;

(3) outputting an microphone acoustic audio test signal from the external speaker and receiving it as input to the microphone of the mobile voice-enabled communications device;

(4) outputting a microphone electric audio output signal from the microphone of the mobile voice-enabled communications device corresponding to the microphone test acoustic audio test signal; and

(5) directly routing the microphone electric audio output signal from the microphone to the auxiliary input/output device using the microprocessor, outputting the microphone electric audio signal from the auxiliary input/output device to an external test system, and analyzing it.

Keller

The Examiner states that Keller discloses or teaches the features of: (i) directly routing the further electric audio signal from the microphone to the auxiliary input/output device using the microprocessor; and (ii) outputting the further electric audio signal from the auxiliary input/output device to an external test system and analyzing it

Keller describes a hearing test system that automatically monitors its acoustic signal output to verify the integrity of the output in real time, monitors the spectral characteristics of ambient noise at the listener's ear in real time, and provides operator alerts and/or automatic test interruption if the noise could invalidate the

test results (FIG. 1). The system consists of a user interface 101, a digital input/output bus 102, a digital signal processor 103, a codec 104, and a speaker 105 and microphone 106 in a `test sound field` 108 coupled to the ear 107 (para [0022]).

However, the microphone 106 in Keller is the mechanism used to verify the integrity of the acoustic signal output. The microphone 106 is not tested in Keller, nor does the system even appear to be configurable to test the microphone 106. The microphone 106 is a "measurement microphone 106" as specifically noted at paragraph [0031]. The microphone 106 "monitors the acoustic signal created by the speaker 105 in the test sound field 108" (paragraph [0022]).

Without engaging in a protracted discussion of the signals in Keller, if the microphone is not tested in Keller, there can be no microphone electric audio test signal, microphone acoustic audio test signal, or microphone electric audio output signal as those terms are used in the claimed invention.

Thus, Keller does not disclose, nor teach or suggest the above-noted features which are not found in Kates.

Rader et al.

Rader et al. describes a mobile phone which is configured to enhance the reception of audio by the user of the mobile phone by compensating for any hearing loss and preferences of the user via a hearing profile of the user. The mobile phone includes an accessory port 213 coupled to the input/output controller 210 used for other types of input/output devices such as alternative communication channels. Thus, Rader et al. does disclose a mobile voice-enabled communications device similar to that in (1). However, as previously submitted, Rader et al. does not describe, nor teach or suggest using the accessory port to route **electric audio signals** from the microphone and outputting the electric audio signals for analysis by an external test system. Rader et al. teaches using the accessory port 213 to **output acoustic audio signals** to binaural or monaural headphones (see for example, paragraph [0038]). Furthermore, Rader et al. does not disclose, nor teach

or suggest using microphone electric audio test signals, microphone acoustic audio test signals, or microphone electric audio output signals as required by the amended claims.

In sum, Kates, Keller and Rader et al. fail to disclose all of the features of amended claim 1. Moreover, the devices and systems of Kates and Keller would have to undergo substantial adaptations and modifications to arrive at a device which outputs a microphone electric audio output signal from the device microphone via an auxiliary input/output device as in the amended claims. Furthermore, there is no apparent basis in the prior art which would suggest modifying the prior art devices or systems to test a device microphone in any way, and more particularly, there is no apparent basis from which the skilled person could arrive at the subject matter of the amended claims.

Claim 23 is directed to a system for testing audio performance in accordance with method claim 1. Thus, the above comments regarding claim 1 also apply to claim 23.

Claim 14 and 31

Claims 14 and 31 have been amended to include the limitation that the acoustic device is a mobile voice-enabled communications device comprising a microprocessor, a microphone connected to the microprocessor, a speaker connected to the microprocessor, and an auxiliary input/output device connected to the microprocessor.

Claim 14 has been further amended to recite a method of testing audio performance and to clarify that a speaker *electric* audio *test* signal is produced on an audio generator external to the mobile voice-enabled communications device and provided as input to the auxiliary input/output device. The speaker *electric* audio *test* signal is then directly routed using the microprocessor to the speaker of the mobile device. The speaker the outputs a speaker *acoustic* audio *output* signal corresponding to the speaker test electric audio signal which is provided as input to

an external microphone. The external microphone then outputs a speaker *electric* audio *output* signal corresponding to the speaker acoustic audio output signal to an external test system, which then analyzes it.

In Kates, the external computer 104 generates an electric audio signal (i.e., an speaker *electric* audio test signal) which is sent to the loudspeaker 108 which then produces the acoustic audio signal 109 (i.e., an speaker *acoustic* audio *test* signal). The hearing aid 110 receives an audio acoustic audio signal 109 via the microphone 154. In contrast, claim 14 requires a speaker *electric* audio *test* signal which is directly input in the mobile device via the auxiliary input/output device from an audio generator.

The system of Keller has an a digital input/output bus 102, however it does not receive a speaker *electric* audio *test* signal which is directly input in the device via the auxiliary input/output device from an audio generator. The digital input/output bus 102 does receive a speaker *electric* audio signal, however this it receives this indirectly and from the speaker 105 not an audio generator as required by the claims. The speaker 105 is not equivalent to an audio generator. Moreover, the test signals produced by the speakers 105 in Keller are for testing the hearing of a patient not testing the functionality of the device.

Claim 31 is directed to a system for testing audio performance in accordance with method claim 14. Thus, the above comments regarding claim 14 also apply to claim 31.

Summary

In sum, Kates, Keller and Rader et al. fail to describe all the limitations of amended independent claims 1, 14, 23 and 31. In addition, the cited references provide no teaching or suggestion why a person of ordinary skill in the art would modify the teachings of these references to arrive at the elements in the manner claimed. Thus, independent claims 1, 14, 23 and 31 are considered to be directed to patentable subject matter. Withdrawal of the rejections under 35 U.S.C. 103(a) is

respectfully requested.

Claims 2-7, 9, 10, 12, 13, 15-19, 21, 22, 24-26, 28-30, 32-34, 36, and 37 depend directly or indirectly from independent claims 1, 14, 23 or 31, and are considered to be directed to patentable subject matter for at least the same reasons given for the base independent claims from which they depend.

Please note that the Attorney Docket Number for this matter is 42783-0118. The Attorney Docket Number currently on file at the USPTO is that of the former Attorney. Please update the USPTO records to reflect the new Attorney Docket Number **42783-0118**.

Favourable reconsideration and allowance of the application are respectfully requested. Should the Examiner have any questions in connection with the Applicant's submissions, please contact the undersigned.

Respectfully submitted,

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